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10/687,257

10/16/2003

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EXAMINER

BURD, KEVIN MICHAEL

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/687,257	<b>Applicant(s)</b> CARBALLO, JUAN-ANTONIO	
	<b>Examiner</b> Kevin M. Burd	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

1. This office action, in response to the amendment filed 9/4/2008, is a final office action.

***Response to Arguments***

2. Applicant's arguments filed 9/2/2008 have been fully considered but they are not persuasive. Applicant submitted remarks on 9/2/2008 and filed a supplemental amendment and remarks on 9/4/2008 following the telephonic interview conducted on 9/3/2008. A brief response to the remarks filed 9/2/2008 is stated below.

As stated in the previous office action, Black discloses detecting a communication problem (determining whether the transceiver of figure 2 is operating as desired) based on the receive settings 76 and transmit settings 74, determined from the BER of the control module, the EYE module (comprising at least one jitter characteristic of the communication link) and the condition of the test signal (comprising at least one jitter characteristic of the communication link). When the level of signal integrity does not provide the desired performance margin, the control module adjusts a programmable operational setting of the multi-gigabit transceiver (e.g., the receive settings 76) (column 6, lines 8-19). Examples of adjustments to the receive settings 76 are described in column 5, lines 29-44. For these reasons and the reasons stated in the previous office action, the limitations of the previous claims are disclosed by the previous references. The claims have now been amended to include additional limitations. This amendment has overcome the previous references since the previous

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references do not disclose the first recommendation indicates the communication channel as a possible source of the communication problem and the second recommendation indicates a different possible source of the communication problem as recited in the claims. Black discloses the output test signal is used to determine the eye opening to establish a performance characteristic benchmark in column 5, lines 10-28. This is the comparing of at least one jitter characteristic to a threshold. A new rejection of the claims is stated below.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-9, 11-16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Black et al (US 7,047,457) in view of Forrester (US 2003/0198306).

Regarding claims 1, 11 and 18, Black discloses a data processing system comprising a transceiver shown in figure 2. The transceiver comprises a communication link to interface the transceiver with other components on the system. The link comprises an interface to receive serial data 52 and process the received data. The programmable receive PMA module 40 is coupled to the received serial data 52 and is enabled to extract the clock signal and a test data signal from the received serial data 52. Figure 5 shows the programmable receive PMA module 40 outputs RX parallel data

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54, a test data signal 72 and a programmable logic RX clock 96. The communication link comprises a control module 35 to determine a bit error rate (BER) of the test data signal. The control module comprises a BER module 37 that receives output test signal 72 and determines the BER (column 5, lines 16-28). The control module 35 also determines at least one jitter characteristic of the communication link. The control module 35 comprises EYE module 39 to establish a control characteristic benchmark (column 5, lines 16-28). In addition, jitter can be induced into a clock to test the receive PMA module 40 in the presence of jitter (column 8, line 64 to column 9, line 5). Also, the recovered clock includes jitter such that the duty cycle of the clock varies from cycle to cycle and over time (column 10, lines 5-9). By adding a known amount of jitter either in the recovered clock or the transmit clock, a processing time margin can be ascertained. If the resultant recovered data has at least a desired bit error rate, then it is known that this particular MGT has a processing time margin that can withstand at least a 20 percent jitter (column 10, lines 5-23). Since the specific jitter characteristic of the communication link is not defined in the claim, the broadest reasonable interpretation of the Black reference discloses at least one jitter characteristic of the communication link comprising at least the EYE module 39 performance benchmark, the jitter induced into the recovered clock or the adding of a known amount of jitter either in the recovered clock or transmit clock as described above. The output test signal is used to determine the eye opening to establish a performance characteristic benchmark in column 5, lines 10-28. This is the comparing of at least one jitter characteristic to a threshold. The control module 35 outputs receive setting 75 and transmit setting 74 in figure 2. When

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the level of signal integrity does not provide the desired performance margin, the control module adjusts a programmable operational setting of the multi-gigabit transceiver (e.g., the receive settings 76) (column 6, lines 8-19). Examples of adjustments to the receive settings 76 are described in column 5, lines 29-44. The adjustments are recommendations regarding a communication problem (determining whether the transceiver of figure 2 is operating as desired). The receive settings 76 and transmit settings 74 are determined from the BER of the control module, the EYE module (comprising at least one jitter characteristic of the communication link) and the condition of the test signal (comprising at least one jitter characteristic of the communication link).

Black does not disclose the first recommendation indicates the communication channel as a possible source of the communication problem and the second recommendation indicates a different possible source of the communication problem. Forrester discloses a larger BER is understood to be undesirable. One drawback of systems in the prior art is difficulty in determining why a high BER is occurring. Because different action to remedy the high BER may be necessary depending upon the cause of the high BER, it is desirable to determine the cause of the high BER. After the cause of the high error rate is determined, appropriate error reducing action may be taken. The method and apparatus described herein may be made to determine the cause of the high BER by adjusting the gain of one or more amplifiers and monitoring for a change in the BER. If, after such adjustment, the BER changes then the reason for the high BER may be determined (paragraph 0043). Forrester discloses monitoring a received signal and outputting a recommendation regarding correction of the problem. Examples of the

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source of the problem comprise unwanted signals such as interference or a jammer or a weak signal (paragraph 0031) or signal disruption generated within the receiver's demodulator (paragraph 0005). By discovering the source of the problem, the steps for correcting the problem can be reduced (paragraphs 007, 0009 and 0010). To correct for high BER, a number of correction procedures will only be effective if the source of the problem is known. For instance, if the problem causing the high error rate is the signal being received is weak, the steps for increasing the current supplied to the mixer to thereby reduce second order blocking products will not be effective in reducing the high error rate. By determining the source of the errors, the method of reducing the errors can be optimized. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Forrester into the system of Black.

Regarding claim 2, Black discloses the communication link of the transceiver comprises a transmitter in figure 2. The transmitter comprises at least an interface coupling the transmitter to other components of the system via TX serial data line 50 and an interface coupling the transmitter to receive information to be transmitted via TX data words line 46. That data to be transmitted will be generated in downstream element. The pattern of the data words will be generated in those downstream elements. In addition, an input test signal 70 will be generated and input to the transmitter as shown in figure 2. The input test signal 70 pattern will be generated as well.

Regarding claim 3, Black discloses programmable receive PMA module 40 receives a RX serial data 52 and outputs a RX parallel data 54 in figure 5.

Regarding claims 4, 6, 12 and 13, Black discloses additional tests are conducted when the operational settings are adjusted to determine whether the MGT now provides the desired performance margin (column 6, lines 8-19). Black discloses an example where a desired bit error rate is achieved and it is therefore known that this particular MGT has a processing time that can withstand the acceptable 20 percent jitter (column 10, lines 18-23). When the BER is not achieved, the particular MGT can not withstand the desired 20 percent jitter entered in the system.

Regarding claim 5, Black discloses the eye opening is an indication of the voltage difference within a bit period and jitter tolerance (column 5, lines 20-28). This jitter tolerance will be used to adjust the receive settings and the additional tests.

Regarding claims 7 and 14, Black discloses the PLL circuit shown in figure 5. The PLL 112 receives data that has been amplified and equalized according to the receive setting 76. The PLL 112 produces the recovered clock 138 from the serial data 124 at the rate of the recovered clock 138 to produce recovered data 136 (column 7, lines 50-55). The recovered data 136 is converted into RX parallel data 54 based on the serial to parallel setting 135 which indicates the desired rate and width of the resulting parallel data 54 (column 7, lines 55-60). The jitter characteristic is a high frequency jitter of the communication link (the phase difference determined in the difference detection module 114) (column 7, line 61 to column 8, line 15 and figure 5) and comprises a modification of the rate of sampling by the CDR circuit as stated above.



Regarding claims 8, 15 and 19, Black discloses the PLL circuit shown in figure 5. The PLL 112 receives data that has been amplified and equalized according to the receive setting 76. The PLL 112 produces the recovered clock 138 from the serial data 124 at the rate of the recovered clock 138 to produce recovered data 136 (column 7, lines 50-55). The recovered data 136 is converted into RX parallel data 54 based on the serial to parallel setting 135 which indicates the desired rate and width of the resulting parallel data 54 (column 7, lines 55-60). The jitter characteristic is a frequency offset of the communication link (the phase difference determined in the difference detection module 114 which is corrected to remove an early or late condition in the difference detection module 114) (column 7, line 61 to column 8, line 15 and figure 5) and comprises a modification of the width of the output data as stated above.

Regarding claims 9 and 16, Black discloses the programmable receive PMA module 40 in figure 5 discloses the PLL 112 comprising a difference detection module 114. The PLL 112 detects when the phase of the RX serial data 124 leads or lags the phase of a feedback signal 121 (column 8, lines 1-15). A phase difference is output when one of these conditions is present and correction signals are output to correct this condition in the PLL, removing the frequency offset between the signals.

4. Claims 10, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Black et al (US 7,047,457) in view of Forrester (US 2003/0198306) further in view of Francos et al (US 2003/0072388).

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Regarding claims 10 and 17, the system of the combination of Black and Forrester does not disclose a look-up table (LUT) for accessing data. Francos discloses a LUT in a circuit receiving an input signal. The LUT stores data and is accessed according to specified input signals (paragraph 0011). The LUT can store any data. It is useful to store data so calculations can be made prior to implementation of a circuit. Real-time data can be processed quicker since the calculations are completed. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to include the LUT of Francos into the system of the combination of Black and Forrester.

### ***Conclusion***

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Burd/  
Primary Examiner, Art Unit 2611  
11/24/2008